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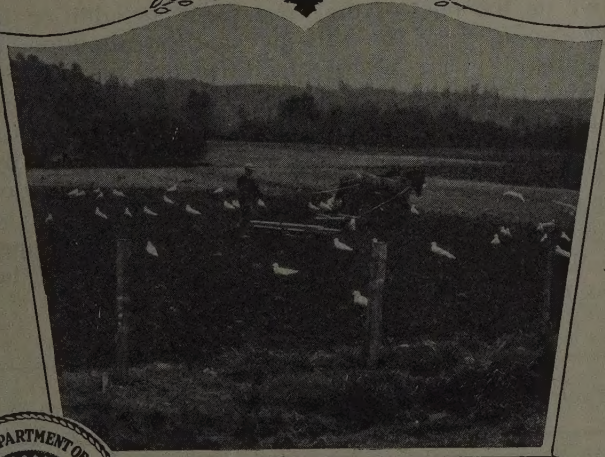
USEFULNESS OF BIRDS ON THE FARM



1931

BIRDS have long been protected for the charm of their songs and their interesting habits. They also deserve careful fostering by man because of their decided economic usefulness.

The economic value of birds is most evident on the farm and it should be most appreciated there. Birds thread their way through garden and field crops, inspect the orchards, explore ornamental shrubbery, and clamber over saplings and trees of the wood lot, gleaning insects wherever they go. Many of these insects are so destructive that the farmer, in his constant fight for pest control, should regard the feathered allies as among his greatest friends.

Protection of the birds should be almost instinctive on the part of the farmer. If, in addition to protecting them, he will give a little attention to improving their nesting facilities and insuring a water supply, he can increase the avian population on his place several fold. He will be repaid not only by the birds' services as insect destroyers, but also by the sprightliness of their presence and the melody of their songs. Aside from the general rural picture of pleasing vegetation, birds—posing, preening, flying, calling, singing—add more to our enjoyment of the countryside than do any other living things.

Washington, D. C. December, 1931

cat. fl. sep.

USEFULNESS OF BIRDS ON THE FARM

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INTRODUCTION

IF FARM LABORERS should offer to make their principal job the killing of insects and other crop pests, asking nothing in return but their board and lodging, farmers would accept the offer with enthusiasm. Yet those most persistent and voracious insect destroyers, the birds, in as large numbers as the farm will accommodate, offer their services on just such terms—and in many cases the farmer does nothing about it. A little protection and a little attention to nesting facilities and water supplies are all that is needed to increase the numbers of these natural pest destroyers. If the supply of wild-fruit food is maintained, about all else that the bird laborers will require for board will be a moderate toll of a few crops, which, in view of services rendered, can well be paid.

The general usefulness of birds in destroying insects is something about which the good observer has no doubt. In an orchard, during the nesting season, he will see the birds active in every direction. Flickers, blackbirds, robins, and thrashers seek their insect prey on or near the ground; woodpeckers, nuthatches, titmice, and chickadees closely search the trunks and limbs of trees; vireos and warblers scan the leaves and probe the flowers; and flycatchers and swallows sweep their prey from the air itself. Every few minutes all day long the hungry young must be fed; and that they are well fed their rapid growth attests. The quantity of insects they and their parents consume is enormous. Not only do orchards benefit by the good work of birds, but gardens, berry patches, and plowed and newly sown fields as well. Though fields actually grown to tall crops are less freely visited, all crops are helped to some extent, and most farm pests have their bird enemies.

COMBINED ATTACKS ON PESTS

To understand the economic value of birds, not only must the feeding habits of species and families be known, but also the collective effect of birds upon pests and crops. Most of the damage they

do results from local overabundance, either of one species or of a number of species of similar feeding habits, and it is inflicted chiefly upon fruit and grain crops. The produce of small numbers of fruit trees especially is liable to severe damage where there is an abundance of fruit-eating birds. In orchards of commercial size damage is less often noticed. Preventive measures are of some avail; but aggressive action is sometimes necessary against birds that persistently destroy fruit crops or grain. Grainfields are seldom severely damaged by birds under modern conditions, except on lands near breeding grounds of bird colonies, populous roosts, or in the migration route of gregarious species. The blackbirds are the most notorious offenders in this respect, and flocks of them at times are so large that it seems there must be a blackbird for every plant in the grainfield.

If birds by their united effort can accomplish great harm, they are for the same reason able to do great good in the destruction of insect pests. Fortunately there are many more helpful than harmful species. Unusual outbreaks of pests upon which birds can feed are always attended by gatherings of the bird clans. In no instance has this been more evident than in the field-mouse plague that occurred in the Humboldt River region of Nevada in 1907–8, during which the damage to crops was placed at $250,000 in a season. Gulls, hawks, and owls flocked to the scene, and all birds able to live upon mice took practically no other food. The birds, it was estimated, destroyed about 900,000 of these field mice each month during the infestation.

The way in which birds concentrate when an outbreak of an injurious insect occurs is illustrated in the case of the alfalfa weevil, a destructive pest accidentally introduced into the region about Great Salt Lake. In two summer's investigations in Utah, 45 species of birds were found to attack the weevil. The killdeer was one of the most active of these, making alfalfa weevils a third of its food during part of the summer; one stomach contained no fewer than 383 individuals, 376 in the larval stage. The record for numbers—442 in one stomach (fig. 1)—was held by Brewer's blackbird, an abundant species in Utah. A surprising discovery was that as a species the English sparrow was the most effective enemy of this insect; alfalfa weevils formed about a third of the food upon which its young were reared, and it was estimated that the number fed to growing English sparrows on a typical Utah farm was about 500,000. To this must be added the number eaten by the adult sparrows, which made of them about a fifth of their food. Most of the common birds of northeastern Utah were depending upon alfalfa weevils for almost a sixth of their entire food, and the destruction of these pests by this warfare is almost beyond conception.

The good work of birds in preying upon another weevil pest, the cotton-boll weevil, must not be overlooked. Sixty-six kinds of birds are known to feed upon this formidable cotton destroyer, probably the most effective being the orioles, which actually remove the boll weevils from the place where damage begins—that is, the squares, or flower buds, of the cotton plants—and the swallows, which feed upon weevils that are in flight. In the stomach of one Bullock's oriole there were found as many as 41 boll weevils, and large numbers

are habitually taken by all species of swallows; every one of a series of 35 eaves swallows had eaten them, the largest number in any stomach being 48, and the average 19.

Another serious agricultural pest that is freely eaten by birds is the wheat aphis, or green bug. On a 200-acre farm in North Carolina, where wheat, rye, and oats were severely attacked by green bugs, it was found that birds were very effective in destroying the pests. The outbreak was at its height during the migration season of such birds as the goldfinch and the vesper and chipping sparrows, which with other species on the farm numbered more than 3,000 individuals. It was found that these birds were destroying green

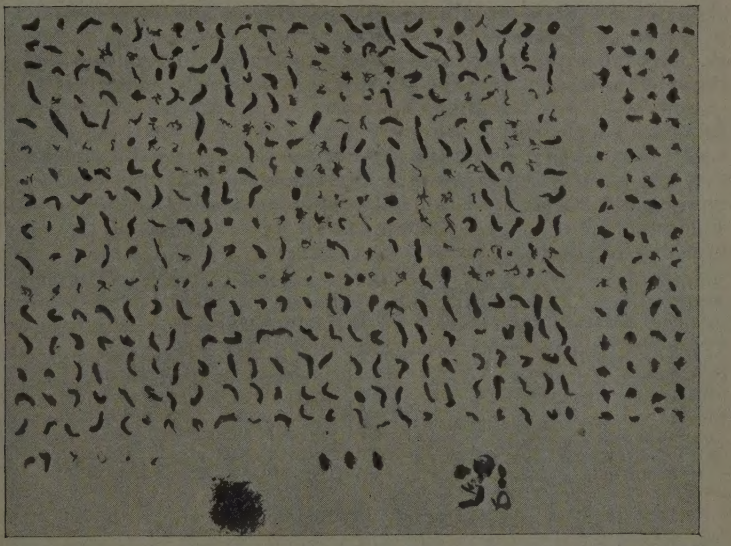

FIGURE 1.—One meal of a Brewer's blackbird. The graphic record of a single bird for destruction of alfalfa weevils. These injurious insects formed 96 per cent of the food of this individual and numbered 442, chiefly in the larval stage; three adult weevils and remains of other insects in the stomach are shown at the bottom of the picture

bugs at the rate of nearly a million a day, and on days when additional flocks of migrants were present this destruction was doubled. During the season such numbers of birds flocked to the grain fields that the aphis infestation was reduced by an incalculable number.

A classic instance of the concentration of bird attack upon an army of insect invaders occurred during the severe outbreaks of the Rocky Mountain locusts between 1865 and 1877. So numerous were these voracious pests that many places they visited were denuded of every green thing. A thorough investigation was made of the relation of birds to the outbreak, and it was found that practically every species, from the largest birds of prey to the tiny hummingbirds, from ducks and other aquatic fowl to typical bird denizens of the dry plains, turned to feeding upon locusts. In fact, most birds

gorged themselves with this abundant supply of food, and in so doing were the means in numerous cases of saving crops from destruction.

DAILY WARFARE ON INSECTS

Conspicuous and important as are the activities of birds in gathering at the scene and taking part in the suppression of insect outbreaks, probably their every-day services in consuming insects of all kinds, thus holding down the whole tide of insect life, are of greater significance. No one who has observed the ceaseless activity of birds in feeding their young can doubt that the destruction of insects in this way is enormous. The house wren brings food to its young about once every two minutes all day long. Not many birds equal this record. Probably one feeding every five to eight minutes is the average rate. Only the insects' enormous powers of reproduction enable them to survive the terrific warfare waged when all the parent birds are foraging on ground, grass, trunks, branches, and foliage, to feed their nestlings.

Not only in the nesting season but all through the year, the birds carry on an intense predatory campaign against the insects. Hardly an agricultural pest exists but has numerous effective bird enemies. The numbers of species of birds known to feed on certain prominent insect pests are given in the following list:

Alfalfa weevil	50	Cutworms	98
Army worm	43	Forest tent caterpillar	32
Billbugs	110	Gypsy moth	46
Brown-tail moth	31	Horseflies	49
Chestnut weevils	85	Leaf hoppers	175
Chinch bug	29	Orchard tent caterpillar	43
Clover-root borer	94	Potato beetle	34
Clover weevil	48	Rice weevil	22
Codling moth	36	Spotted cucumber beetle	42
Cotton-boll weevil	66	White grubs	95
Cotton worm	41	Wireworms	205

OUR BIRD POPULATION

In the United States are found more than 800 distinct kinds of birds of 75 families, 22 families of which are classed as water birds, 7 as shore birds, 5 as upland game birds, 5 as birds of prey, and 36 as land birds. In general, the smaller land birds are of greatest interest to the farmer and orchardist. Of the larger birds, however, the upland game birds, the hawks, and the owls deserve notice.

UPLAND GAME BIRDS

The upland game birds comprise such familiar groups as quail, grouse, introduced partridges and pheasants, and wild pigeons and doves. Quail have rarely been charged with damaging crops, but the ruffed grouse sometimes eats buds of apple trees to an injurious extent; pheasants occasionally eat corn, peas, tomatoes, and other crops more than is to the liking of individual farmers; the band-tailed pigeons of the West may devour fruits to excess; and mourning doves in some localities feed upon sprouting seeds of farm crops. All these game birds except the doves and pigeons do some good in consuming insect pests; all are of value to the farmer by making

his land attractive for hunting, a privilege that he can dispose of for profit if he desires; and, finally, because they are valuable as food species and are eagerly shot for sport, all can be quickly reduced in numbers whenever that course proves necessary.

BIRDS OF PREY

The birds of prey include the carrion-feeding vultures, the fiercely rapacious hawks and eagles, the fish-loving osprey, and owls of various habits. The vultures, of which the familiar black and turkey buzzards are examples, are carrion feeders and will disappear from communities where all offal is properly disposed of, but in some localities they still have plenty of work to do. The charge that they are instrumental in distributing hog cholera and other livestock diseases is based chiefly on suspicion. It is not true that they disseminate the germs of these diseases in their droppings, and the fact seems to be that buzzards, if a factor in spreading stock ills, are a minor one.

Hawks and owls, though not closely related, may be considered together on account of the similarity of their feeding habits. Feeding chiefly upon living animals smaller than themselves, they naturally prey sometimes upon some of the domesticated kinds, particularly poultry. This has given them a bad reputation with farmers, so long established as to amount to traditional prejudice. Scientific investigation of their habits shows that only a few species of hawks and only one owl feed chiefly, or even largely, upon birds, and therefore to any great extent upon poultry. The birds of prey correctly regarded as chiefly injurious include the sharp-shinned, Cooper's, and duck hawks, the goshawk, and the great horned owl. The bird hawks fly swiftly over trees and bushes and make sudden darts upon their prey, and from this behavior and their color, three of the species are often known as blue darters. The hawks that are chiefly beneficial differ in flight from the darting hawks, either soaring at a considerable height or hovering over places where they are seeking prey. The great horned owl, which, like most of its relatives, feeds at night, can capture only poultry that has not been properly protected. When prevented from doing this, the horned owl is largely beneficial rather than injurious.

The remaining species of hawks and owls, more than 50 in all, have useful habits. They feed on a great variety of rodents and have a tremendous effect in controlling the numbers of these pests. Their staple food consists for the most part of meadow mice, but it includes also many other destructive rodents, such as rabbits, ground squirrels, prairie dogs, pocket gophers, and house rats and mice. The barn owl (fig. 2) is one of the most useful birds of this group. Its food is easily studied by examining the pellets, made of the hair and bones of its victims, which accumulate about its roost. These indigestibles are ejected habitually by all birds of prey, but are scattered too widely for collection and study except by species having restricted roosting sites.

In 675 barn-owl pellets collected in Washington, D. C., were found the remains of 1,119 meadow mice, 452 house mice, and 134 house rats, together with a sufficient number of other small mammals to make an average of almost 3 to the pellet, and probably to the meal.

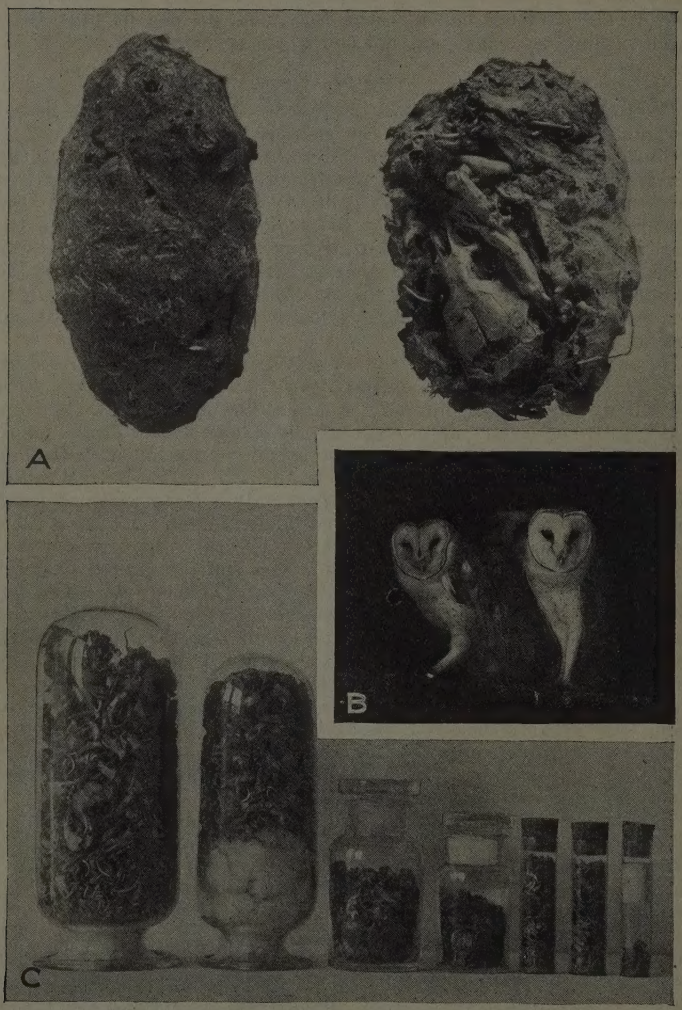

FIGURE 2.—The barn owl and its food: A, Barn-owl pellets, indigestible portions of the food rolled up and ejected; these are often an inch in diameter, and 2 to 2½ inches long. B, barn owls in their roost; C, contents of 592 pellets investigated—1,058 skulls of pocket gophers, rats, and mice. Most owls are valuable aids to the farmer by their destruction of numerous harmful small animals

In 592 pellets collected in California were found skulls and other traces of 261 pocket gophers, 74 field mice, 184 pocket mice, 144 deer mice, 50 harvest mice, 230 kangaroo rats, and 215 house mice.

These items make it clear that the barn owl is constantly doing work of great value to agriculture. Its services are typical of those of hawks and owls in general. Owls as a group have long been persecuted by man, but never has persecution been more unjust. However, the hawks and owls are not the only sufferers, for when their numbers are greatly reduced in any community, farmers will be forcibly reminded of the fact by a great increase in the number of destructive rodents.

FIGURE 3.—The woodpecker and its helpful work: A, Hairy woodpecker, one of the 24 species of birds of this large family, most of which are highly beneficial (photo by C. F. Stone); B and C, examples of work of woodpeckers—their bills are specially fitted to dig out wood-boring larvae from deep in the trees

CUCKOOS AND WOODPECKERS

Though many of the birds of prey, game birds, and wild fowl have distinct economic value, one must turn to the characteristic land birds to find whole families that are almost uniformly beneficial and for large numbers of species practically perfect from the economic point of view. Among the most praiseworthy birds are the cuckoos. The most widely distributed species, the yellow-billed and black-billed cuckoos, usually keep out of sight, but are well known by their strange notes. As these are thought to be given most freely before rains, the birds are frequently called "rain crows." The cuckoos feed very largely on caterpillars, and more than most other birds, on the hairy and spiny kinds. One stomach contained 250 tent caterpillars and another 217 fall webworms. The cuckoos are fond also of grasshoppers, sawfly larvae, plant bugs, and other injurious insects.

The largest and important woodpecker family includes 24 species in the United States, most of them highly beneficial. They are the chief defenders of trees against insect attack, most of them being

specialized to feed upon wood-boring larvae, pests preyed upon by few other birds. (Fig. 3, c.) From a third to two-thirds of the entire food of several species consists of wood-boring insects. From 10 to 80 per cent of the annual diet of various species is made up of ants, which are almost uniformly injurious. The flickers, or yellow-hammers, especially are assiduous destroyers of ants, one of these birds being known to have taken more than 5,000 at a single meal.

NIGHTHAWKS AND HUMMING BIRDS

A group of birds the members of which, though diverse in appearance, are related in essential characters, includes the chuck-will's-widows, whippoorwills, poowills, nighthawks, swifts, and humming birds. All are almost strictly insect eaters and consequently beneficial. The larger ones feed extensively upon leafchafers, the larvae

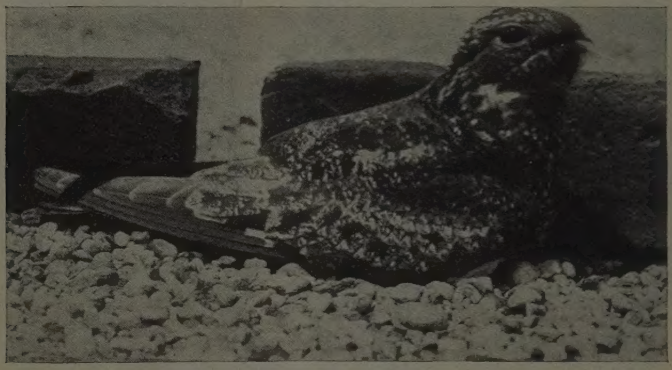

FIGURE 4.—The nighthawk, an extremely valuable insect destroyer. This bird, often wantonly shot, scoops its prey out of the air, and more than 50 different kinds of insects, represented by thousands of individuals, have been found in single nighthawk stomachs. (Photograph by Lewis F. Hall)

of which, including the well-known white grubs, are very destructive. The nighthawks (fig. 4) take considerable of the same sort of food, but, in common with the swifts, capture a great variety of small insects, more than 50 different kinds having been found in single stomachs, represented in some cases by thousands of individuals. The humming birds devour minute insects, which they find in flowers or catch on the wing, and do not subsist to so large an extent as ordinarily supposed upon the nectar of flowers.

FLYCATCHERS

One family of birds gets its popular name, flycatcher, from its insect-eating habit. Among the 31 members of the flycatcher family living in the United States are such birds as the spectacular scissortail, the bold, dashing kingbird, and the more quiet and domestic phoebe. An average of 95 per cent of the food of these birds has been found to consist of insects. The rose chafer, a species of insect not only destructive to vegetation, but known to be poisonous to chickens and pheasants, is freely eaten by the kingbird. Several

flycatchers have the reputation of eating honeybees to an injurious extent, but it has been shown that they take mostly drones, and furthermore, that they kill enough enemies of the bees, like robber flies, to pay for all the domestic bees they take.

JAYS, CROWS, AND RAVENS

Jays, crows, and ravens have always been severely criticized, and it must be admitted that on the whole the criticism is justified. About the best that can be said for birds of this family is that on an average they do about as much good as harm. It would seem a good policy to accord them all the same treatment long given the common crow—the crow is not especially persecuted, neither is it protected. Thus, while the birds are allowed to exist in reasonable numbers for the sake of the good they do, the way is left open for aggressive measures against them when necessary. In the case of this family, as of all destructive birds, damage usually is the result of overabundance.

BLACKBIRDS

The damage done by the blackbirds is conspicuously the result of overpopulation. One of the most characteristic habits of these birds is flocking, and some of their gatherings are enormous. In their winter home along the Gulf coast flocks of blackbirds at a distance look like great clouds or rolling balls of dense smoke. Fortunately, at the time when these birds are assembled in these armies there is nothing for them to damage, and their flocks are much smaller at the season when grain from the milk stage to maturity is exposed to their attack. Nevertheless, the damage sometimes is serious, and protection of these species is not recommended. In the same family with the blackbirds, however, are such birds as orioles and meadow larks, and these do much more good than harm.

SPARROWS

The great sparrow family, comprising almost a hundred species in the United States, as a whole shows a good economic record. The introduced English sparrow, usually a nuisance and often injurious, is, it must be remembered, but one of this large family, and its habits are by no means characteristic of the native species. The sparrows, or finches, are essentially seed eaters, but they consume also a fair proportion of insects, and in general must be regarded as beneficial. Certain species at times take too many birds, and a few others occasionally damage grain, but these practices are exceptions that may be met by local control.

OTHER INSECT EATERS

The tanagers and swallows (fig. 5) are almost exclusively beneficial, the latter especially being tireless destroyers of a great variety for insects. They course systematically over fields and gardens, over land and water, and gather up untold numbers of the small pests that are a constant menace to our comfort and prosperity.

If soft plumage and harmonious colors were the criteria of bird worth, the cedar waxwing would stand near the top. Economically, however, it is in the doubtful, even the very doubtful, class. It is

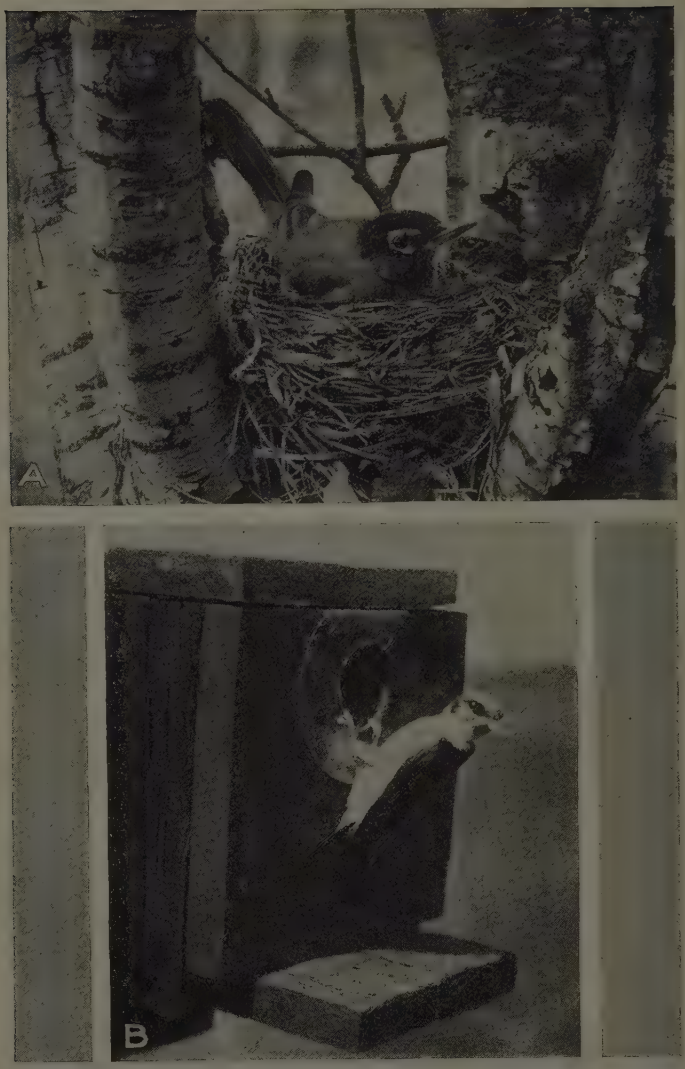

FIGURE 5.—Caring for the brood: A, Robin on nest—a bird universally known and almost everywhere beloved, sometimes too attentive to cultivated fruits (photograph by F. A. Kinsey); B, tree swallow at nest box, bringing a cranberry moth to its young (photograph by E. H. Forbush); swallows are tireless destroyers of a great variety of injurious insects

too fond of flowers, buds, and fruits, especially cherries, and while gratifying these tastes it consorts in such large flocks that the interests of mankind suffer considerably.

The butcher birds, or shrikes, which have the curious habit of hanging part of their prey upon thorns, in crotches, or in other suitable places, destroy some other birds, but on the whole are beneficial.

About 10 kinds of the smooth green-coated vireos and 55 kinds of warblers of varied and brilliant but neat plumages are special guardians of the foliage of trees. These little birds scan twig and branch and limb, snapping up the caterpillars, scale insects, plant lice, and others, which collectively are so great a drain upon the vitality of trees. There are millions of warblers and vireos in North America, and their destruction of insects in the aggregate is beyond conception.

Allied in service to the warblers are the bark-climbing creepers, the industrious and inquisitive nuthatches, the restless and active

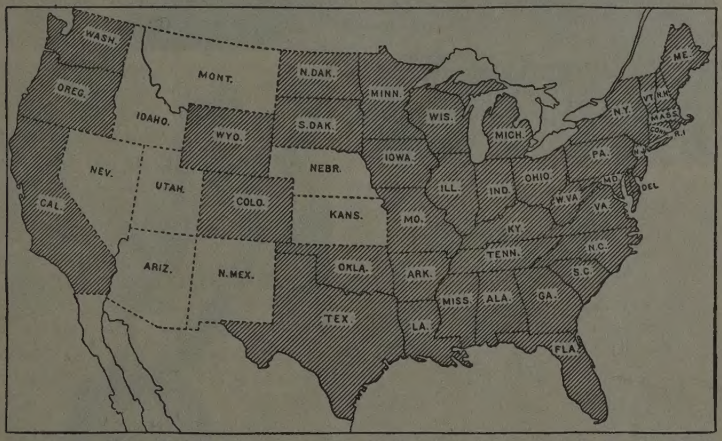

FIGURE 6.—The shaded area shows the States that have adopted the American Ornithologists' Union model law for the protection of birds

chickadees and titmice, and the tree-scanning kinglets and gnatcatchers, of which groups there are in the United States more than 25 species. They either pursue their prey chiefly among foliage, as do the warblers, or supplement this work by seeking insects on the bark of trees and in crevices and cavities everywhere. Some of the smaller of these birds are especially meritorious on account of their destruction of the eggs of insects.

Mocking birds, catbirds, and thrashers are distinguished by unusual ability as songsters. Economically considered, all are rather too fond of cultivated fruits, but as a rule they do more good than harm, and experience shows that despite the damage they inflict these birds are usually desired in the vicinity of homes and even invited there for the sake of their songs.

Closely related to the mockers and thrashers are the wrens, 11 species of which occur in the United States. These little birds are

incessantly active, tireless, and good singers, almost wholly insectivorous, and consequently beneficial to a high degree. About the only complaint made against them is that the familiar house wren interferes with the nests and eggs of other birds.

Only one family of small land birds remains to be mentioned, namely, that including the thrushes, robins, and bluebirds. The thrushes are characteristic woodland species, and while not of great economic importance are for the most part commendable in their

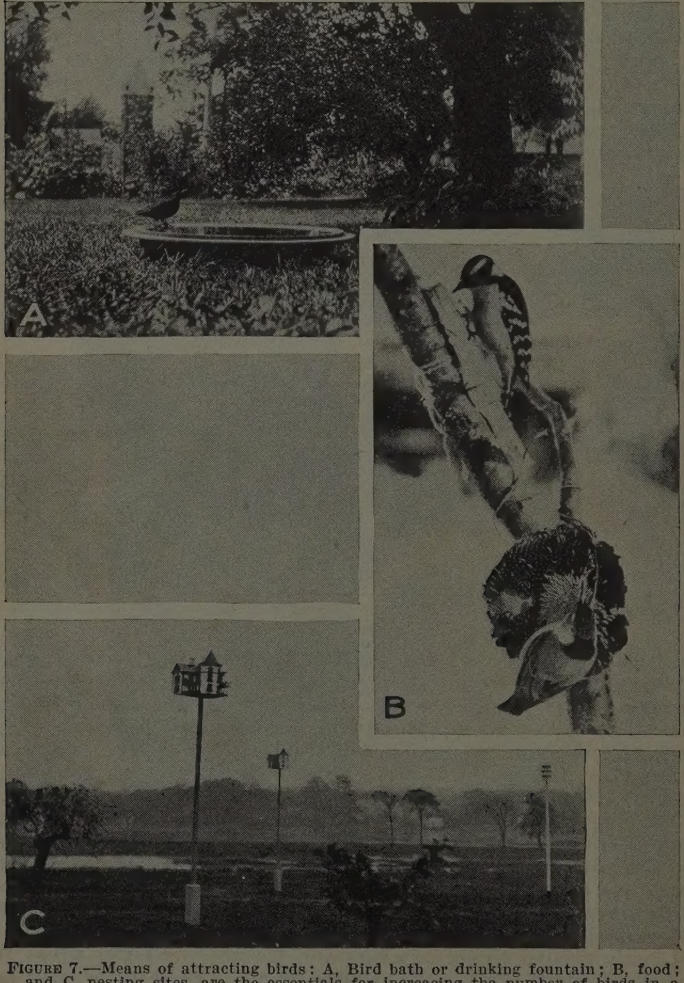

FIGURE 7.—Means of attracting birds: A, Bird bath or drinking fountain; B, food; and C, nesting sites, are the essentials for increasing the number of birds in a locality. Areas inhabited by large numbers of birds are ordinarily practically immune from the ravages of insects. (Photos A and B by F. E. Barker and Carl Purple, respectively; C, by E. H. Forbush)

relation to man. Robins and bluebirds are the most familiar species about our homes and so beloved are they that they are almost immune from persecution. The bluebirds strictly deserve this high consideration, but the robins (fig. 5, A) take a large toll from cultivated fruits, and probably are too numerous in many localities.

PUBLIC ATTITUDE TOWARD BIRDS

Public action in bird protection has received much attention in the United States. The Bureau of Biological Survey has proved the value of birds; the American Ornithologists' Union and the National Association of Audubon Societies have engaged in prolonged campaigning for bird protection. As a result, the American Ornithologists' Union model law for protection of birds has been adopted by 40 of the 48 States. (Fig. 6.) The migratory-bird treaty act, putting into force a treaty with Great Britain for the protection of migratory birds, supplements and reinforces the State legislation. So far as desirable laws are concerned, the United States leads the world in bird protection.

It remains for public opinion to back the law, for citizens to put into effect every practicable measure for increase and conservation of bird life. Experience has shown that efforts to attract birds and increase their numbers are rewarded by very encouraging results. The essentials of bird attraction (fig. 7) are the suppression of enemies and the provision of food, water, and nesting sites.

From the normal number of one pair of birds to the acre under natural conditions, bird-attraction methods [1] have increased the numbers in certain areas up to 10, 27, 40, and even more, pairs to an acre. Areas inhabited by such large bird populations ordinarily are practically immune from the destructiveness of insects.

Aside from the economic advantages of an increased number of birds, the esthetic phase of bird attraction must not be overlooked. Nearly everyone enjoys watching birds. Birds typify life, beauty, and sprightly activity, and the songs of many of them are sources of great pleasure. Their presence in large numbers means increase in all these forms of enjoyment.

Material increase in the number of birds admittedly is a two-sided problem: Some birds of little or no value should not be increased, while others, not now noticeably destructive, may become so when they are more abundant. On the other hand, there is no doubt that the majority of birds are more beneficial than injurious, and that by increasing their numbers we shall do ourselves and our country a valuable service.

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[1] Publications giving details of methods of attracting birds may be obtained upon application to the U. S. Department of Agriculture. The following are suggested: Farmers' Bulletins 621, How to Attract Birds in the Northeastern States; 760, How to Attract Birds in the Northwestern States; 844, How to Attract Birds in the Middle Atlantic States; 912, How to Attract Birds in the East Central States; 1456, Homes for Birds; and 1644, Local Bird Refuges.

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